

# Safety Restraint Examination





Authority: 1949 PA 300, Sec.257.822 Compliance: Required MSP UD-10E Penalty: \$100 and/or 90 days (Rev 11/2006)			External # Crash ID ##### 8036809			Page 01 of 01 Incident # <input type="text"/> File Class 9300-1			
STATE OF MICHIGAN TRAFFIC CRASH REPORT			Department Name Bloomfield Twp Police Dept			Incident Disposition: Closed			
ORI: MI 6326200		Crash Date 05/19/2011	Crash Time 01:07	No. of Units 01	Crash Type Single Motor Vehicle	Special Circumstances <input checked="" type="radio"/> None <input type="radio"/> School Bus <input type="radio"/> Hit and Run <input type="radio"/> Deer <input type="radio"/> Fleeing Police	Special Checks <input type="radio"/> Fatal <input type="radio"/> Non-Traffic Area <input type="radio"/> ORV/Snowmobile		
County 63 - Oakland		Traffic Control None	Relation to Roadway Shoulder		Special Study	Weather Cloudy	Area 10 - NON-FRWY Straight roadway		
City/Twp: 03 - Bloomfield Twp		Construction Zone (if applicable) Type	Lane Closed	Activity	Light Dark-Unlighted	Road Condition Wet	Total Lanes 03	Speed Limit 50	Posted Yes
LOCATION	Prefix Road Name WOODWARD			Road Type AVE			Suffix	Divided Roadway	
	Distance 700 Feet N			Traffic Way 02 - Divided Hwy wo/barrier			Access Control 03 - Other, partial control		
	Prefix W Intersecting Road BIG BEAVER			Road Type RD			Suffix	Divided Roadway	
Unit Number 01	Unit Known Yes	State MI	Driver License Number #####	Date of Birth (Age) 07/23/1991 (19)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffer <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 16 - Careless/negligent
DRIVER	Unit Type MV	Driver Information ##### ##### BLOOMFIELD HILLS, MI 48304-3554 (###) ####-####				Injury A	Position 01	Restraint 04	Hospital WILLIAM BEAUMONT HOSPITAL
DRIVER	Driver Condition 0 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 99				Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance BLOOMFIELD TWP FIRE DEPT
DRIVER	Alcohol <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Refused <input type="radio"/> Not offered Test Type <input type="radio"/> Field <input type="radio"/> PBT				Test Results <input type="radio"/> Breath <input type="radio"/> Blood <input type="radio"/> Urine		Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Blood <input type="radio"/> Urine	Citation Issued <input type="radio"/> Hazardous <input type="radio"/> Other	
VEHICLE	Vehicle Registration #####		State MI	Insurance / Policy # #####	Towed To/By #####		Special Vehicles 0	Private Trailer Type	Vehicle Defect
VEHICLE	VIN #####		Vehicle Description MERCURY	Make MERCURY	Model MARQUIS	Color BLUE	Year 2003	Vehicle Type Passenger Car	
VEHICLE	Location of Greatest Damage 07	First Impact 08	Extent of Damage 7	Driveable No	Vehicle Direction S	Vehicle Use 01 - Private	Action Prior 01 - Going Straight Ahead		
Sequence of Events: First Event: 04 - Ran off roadway-right Second Event: • 39 - Tree (• indicates MOST harmful event)									
Passenger Information					Date of Birth (Age)	Sex	Position	Restraint	Hospital
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance
Passenger Information					Date of Birth (Age)	Sex	Position	Restraint	Hospital
					Injury	Airbag Deployed	Ejected	Trapped	Ambulance

Road Type AVE	Suffix	Divided Roadwa			
Traffic Way 02 - Divided Hwy wo/barrier	Access Control 03 - Other, partial control				
Road Type RD	Suffix	Divided Roadwa			
Date of Birth (Age) 07/23/1991 (19)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffer <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 16 - Careles
#) #####	Injury A	Position 01	Restraint 04	Hospital WILLIAM BEAUMONT HOSPITAL	
Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance BLOOMFIELD TWP FIRE DEPT	
Test Results	Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No Test Type <input type="radio"/> Blood <input type="radio"/> Urine	Test Results	Citation Issued <input type="radio"/> Hazardous		
#####	Towed To/By #####		Special Vehicles 0	Private Trailers	
Model MARQUIS	Color BLUE	Year 2003	Vehicle Type Passenger Ca		

The value entered here is the *investigator's opinion*

Road Type AVE	Suffix	Divided Roadway			
Traffic Way 02 - Divided Hwy wo/barrier	Access Control 03 - Other, partial control				
Road Type RD	Suffix	Divided Roadway			
Date of Birth (Age) 07/23/1991 (19)	License Type <input checked="" type="radio"/> Operator <input type="radio"/> Chauffer <input type="radio"/> Moped	Endorsements <input type="radio"/> Cycle <input type="radio"/> Farm <input type="radio"/> Recreation	Sex M	Total Occupants 01	Hazardous Action 16 - Careless
Injury A	Position 01	Restraint 04	Hospital WILLIAM BEAUMONT HOSPITAL		
#) ######	Interlock No	Ejected	Trapped	Airbag Deployed Yes	Ambulance BLOOMFIELD TWP FIRE DEPT
Test Results	Drugs <input type="radio"/> Yes <input checked="" type="radio"/> No	Test Type <input type="radio"/> Blood <input type="radio"/> Urine	Test Results	Citation Issued <input type="radio"/> Hazardous	O
####	Towed To/By #####	Special Vehicles 0	Private Trailers		
Model MARQUIS	Color BLUE	Year 2003	Vehicle Type Passenger Ca		

Occupant's statement

Witness's statement

EDR

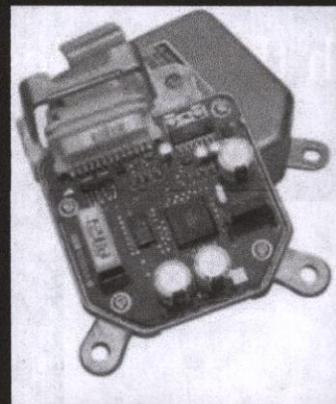
Physical evidence

Injury pattern

# Choices, Choices

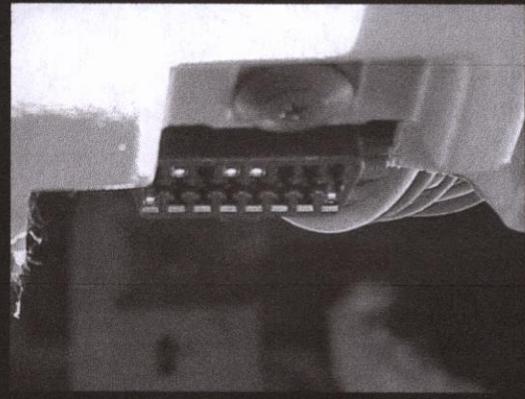
	<u>Restraint</u>		<u>Helmet</u>
01	No belts available	10	Helmet worn
02	Shoulder belt only used	11	Helmet not worn
03	Lap belt only	12	Helmet use unknown
04	Shoulder and lap belt used		
05	No belts used		
06	Child restraint used		
07	Child restraint not used, not available or improper		
08	Restraint failure		
09	Restraint use unknown		

## Event Data Recorder

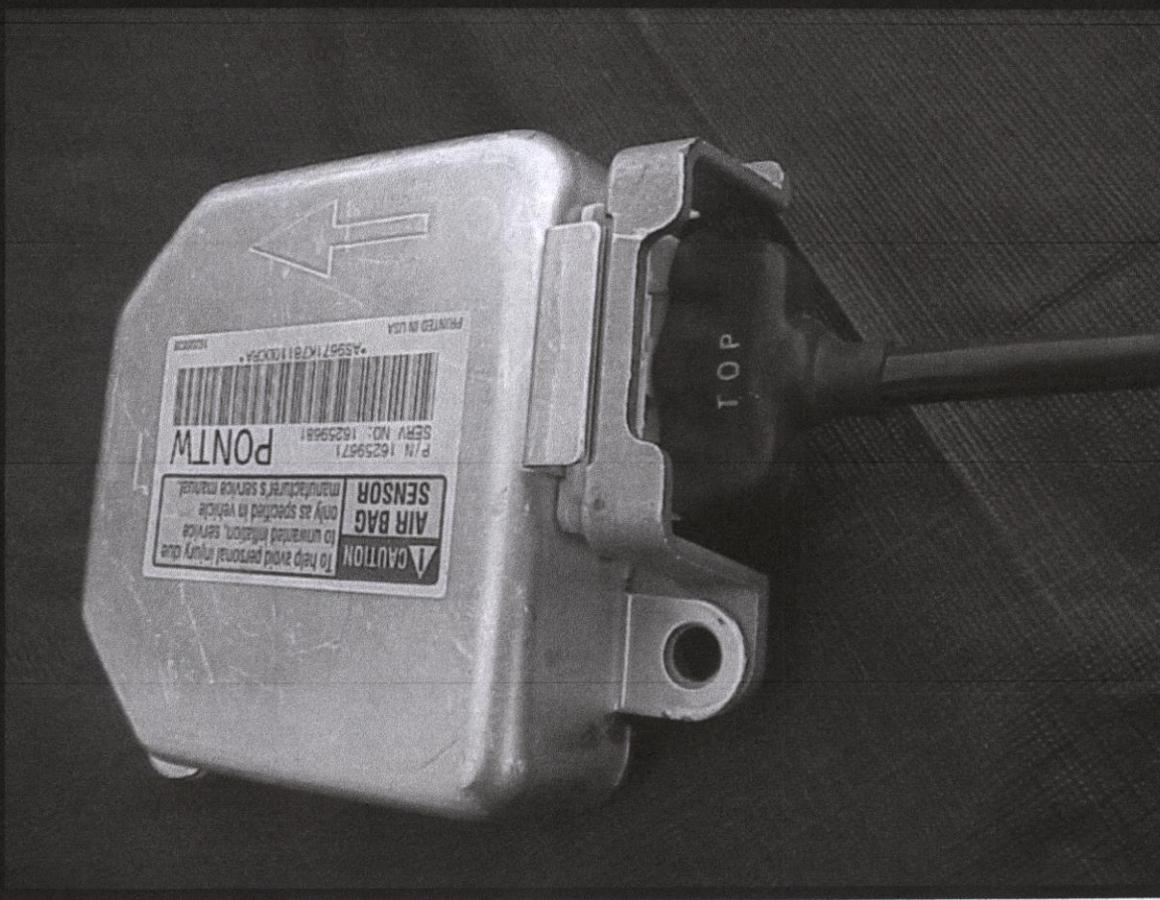


## Two Methods to Download Data

Through the vehicles Diagnostic Link Detector (DLC)



Direct to the airbag module



## The Only Ways To Unlatch a Buckle In A Crash

- OVERLOAD
- INADVERTENT CONTACT
- FALSE LATCH
- PARTIAL ENGAGEMENT
- INERTIAL RELEASE

Knowing that seatbelt buckles can unlatch in a crash, it is incumbent on any type of investigator to conduct a thorough seatbelt investigation before concluding a person was belted or unbelted when an crash began. However, this isn't always done.

In fact, oftentimes, people jump to a conclusion that a person was unbelted when they see or learn that a person was ejected from the vehicle during a motor vehicle crash.

## "UNBUCKLED" STATUS IS SOMETIMES WRONG"

If someone relies exclusively on the sensing diagnostic module (SDM) data retrieved from the vehicle's onboard computer, they may be relying on flawed data. The NHTSA has uncovered hundreds of accidents where the SDM indicated the ejected person was in fact "buckled."

 <b>Vetronix</b>	 <b>CDR</b>
Vehicle Identification Number 3GNPK16R8XG134932	
Investigator	John
Case Number	scott krist
Investigation Date	02-06-02
Crash Date	
Filename	3GNPK16R8XG134932 #1.CDR
Saved on	2/6/02 1:07:10 PM
Data check information	A4800B71
CDR version	Crash Data Retrieval Tool 1.200
Program verification number	948D3C51
© 2002 Vetronix Corporation	
 <b>Vetronix</b>	 <b>CRASH DATA RETRIEVAL</b>
<b>System Status At Near Deployment</b>	
SR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Near Deployment	6517
Ignition Cycles At Investigation	6520
Algorithm: Enable to Maximum SDM Recorded Velocity Change (msec)	83.75
Maximum SDM Recorded Velocity Change (MPH)	-8.3372

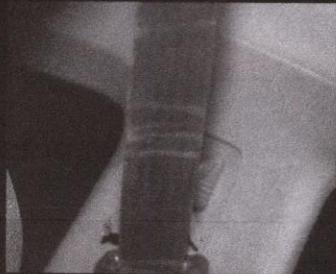
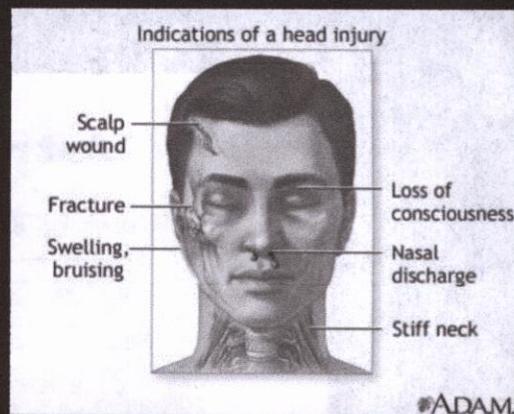
 <b>Vetronix</b>	 <b>CDR</b>
Vehicle Identification Number 3GNFK16R8XG134932	
Investigator	John
Case Number	scott krist
Investigation Date	02-06-02
Crash Date	
Filename	3GNFK16R8XG134932 #1.CDR #3
Saved on	2/6/02 1:07:10 PM
Data check information	A480DB71
CDR version	Crash Data Retrieval Tool 1.200
Program verification number	948D3C51

 **Vetronix**       **CDR CRASH DATA  
RETRIEVAL  
SYSTEM**

**System Status At Near Deployment**

SIR Warning Lamp Status	OFF
Driver's Belt Switch Circuit Status	BUCKLED
Passenger Front Air Bag Suppression Switch Circuit Status	Air Bag Not Suppressed
Ignition Cycles At Near Deployment	
Ignition Cycles At Investigation	6517
Algorithm Enable to Maximum SDM Recorded Velocity Change (msac)	6520
Maximum SDM Recorded Velocity Change (MPH)	93.75
	-8.3372

## Physical Evidence

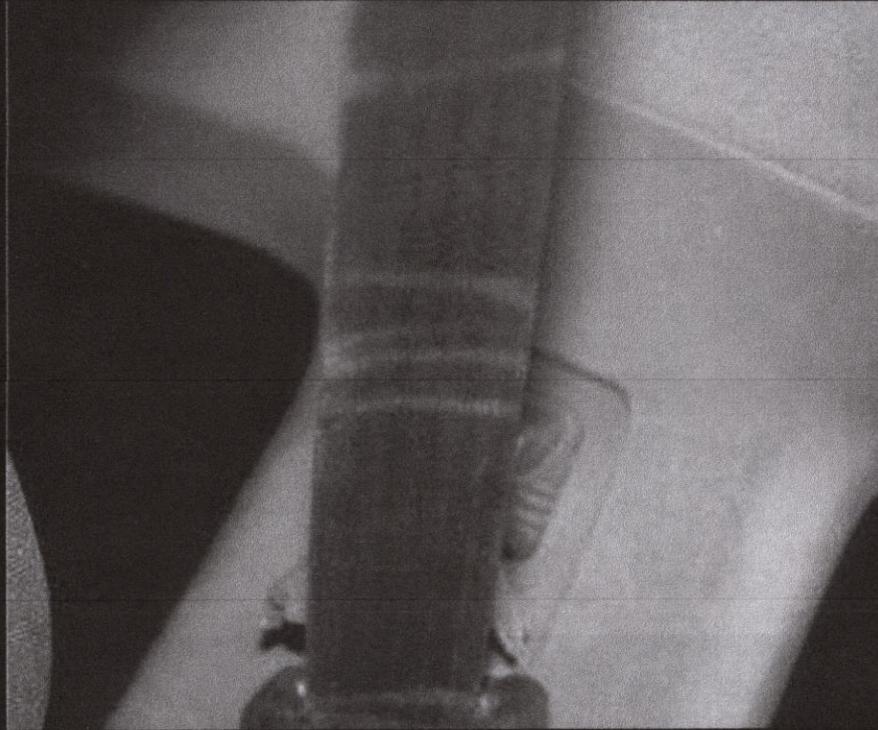


There have been crashes reported where the decedent was still found belted inside his vehicle and the EDR download indicated "unbuckled." Still other reported accidents had the decedent ejected from his vehicle when the seat collapsed rearward, and yet the buckle was still latched but the EDR download indicated "unbuckled."

Some, crash investigators have concluded that people are unbelted when they are ejected or displaced from their reported seating position inside the vehicle.

Jumping to a conclusion without evaluating any of the physical, medical or forensic evidence is a rather close-minded and shallow methodology. In fact, it is no methodology at all.

SOMETIMES SEATBELT USAGE EVIDENCE  
IS VERY OBVIOUS SUCH THAT THERE ARE  
“TRADITIONAL” WITNESS MARKS

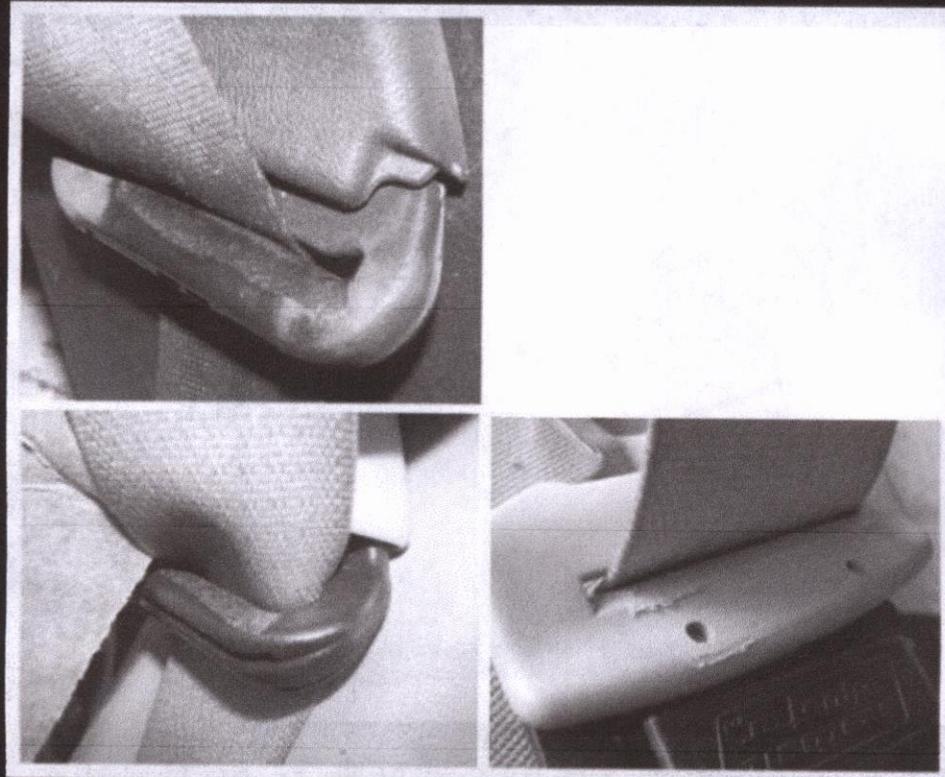




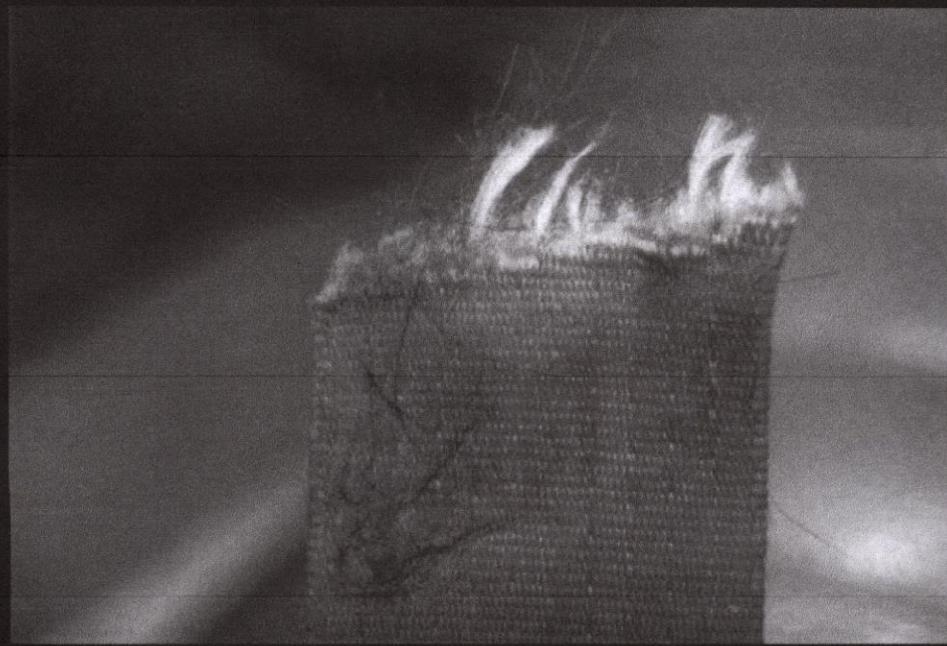
Retractor jammed with webbing extended.



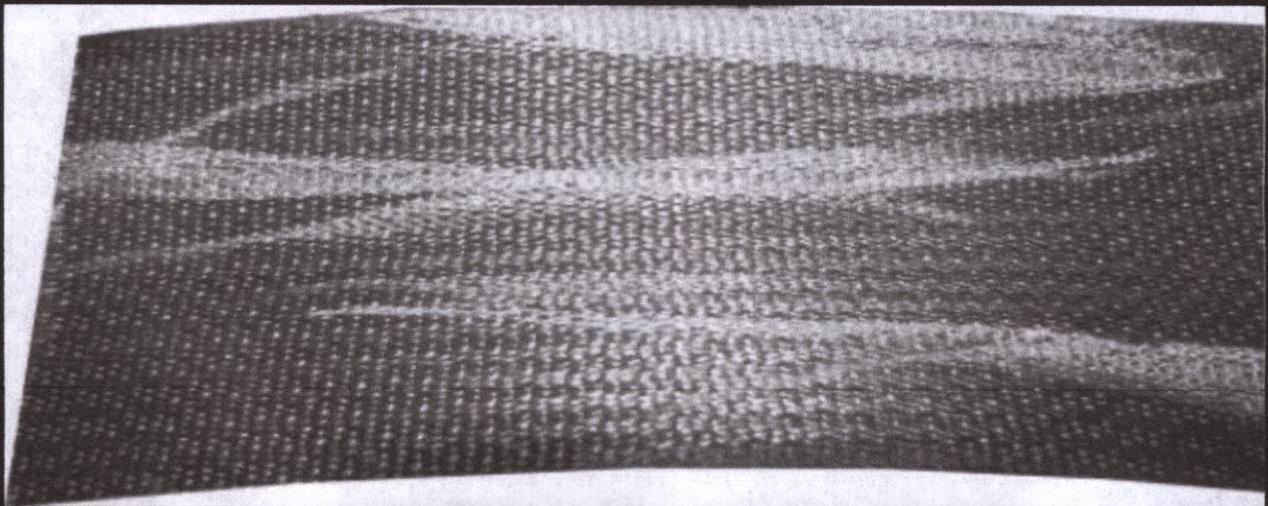
Retractor frame damaged when seatbelt load is applied.



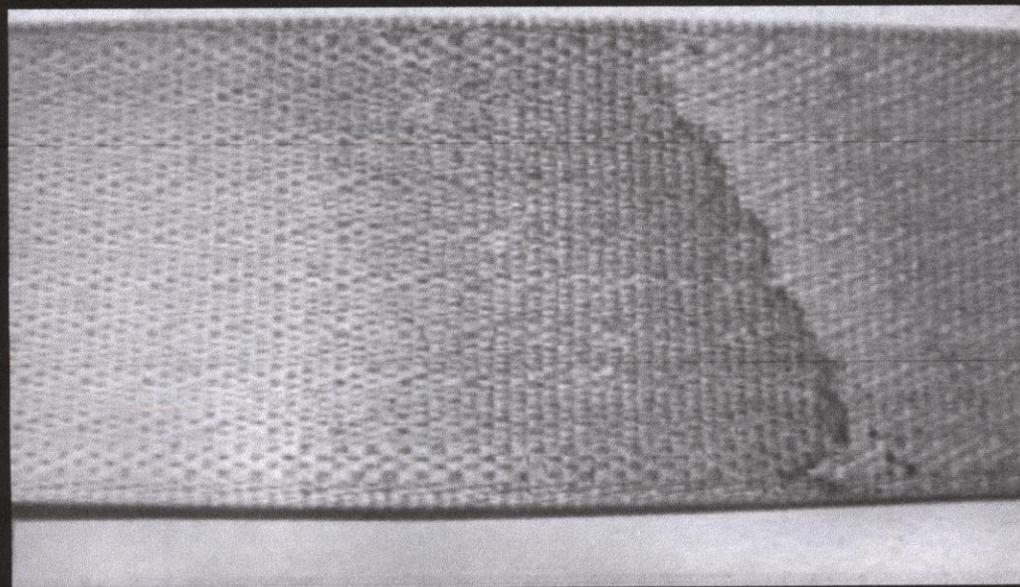
Imprint of the webbing in plastic coated parts of the restraint, such as the latch plate or D-ring. There is often a corresponding transfer of plastic to the webbing.



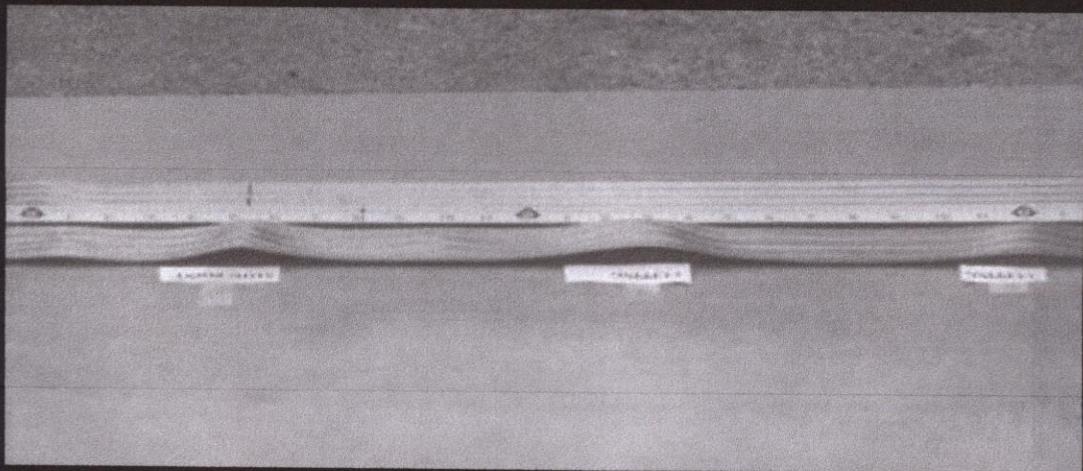
Torn or broken seatbelt webbing due to overload or a sharp surface.



Webbing is discolored due to clothing transfer.



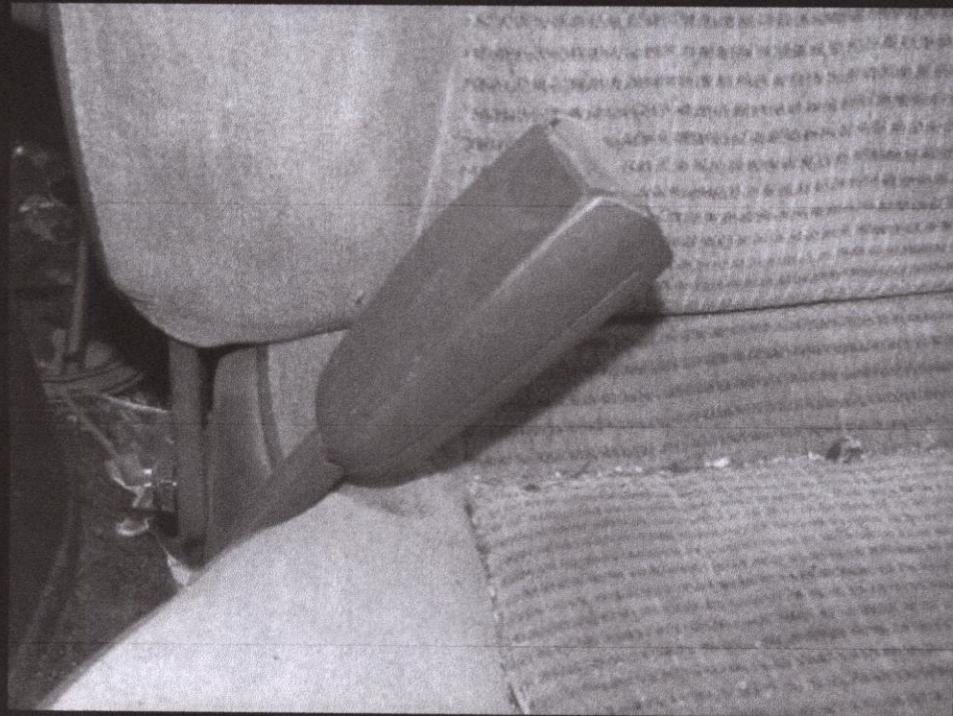
Plastic transfer from D-ring / latch plate on webbing.



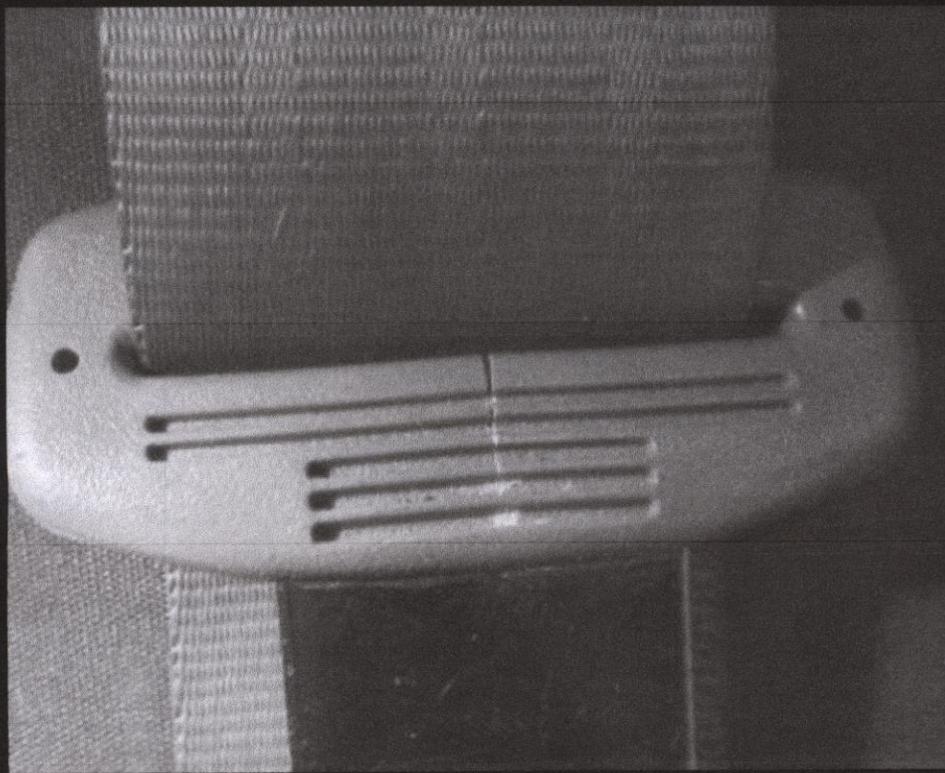
Webbing curled. (Also often called "cupping")  
This is caused from occupant loading.



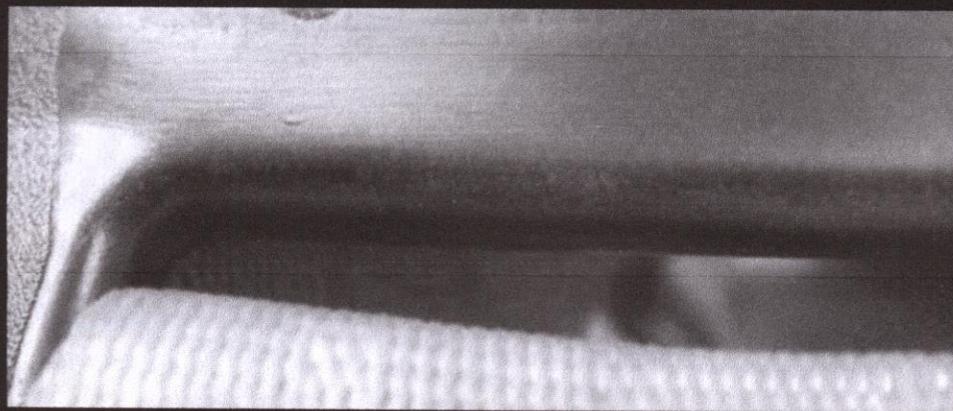
D-ring fractured due to loading.



Seatbelt buckle stalk is deformed due to loading.



Latch plate fractured due to loading

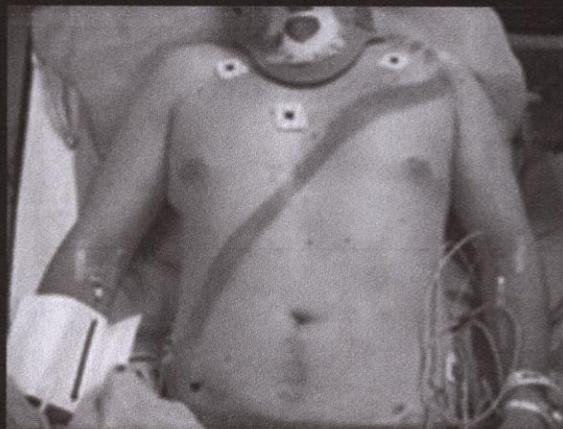


Friction marks may be visible



Airbag deployment prevented loading

## Injury Patterns



## External Injuries

### Chest Injuries

Patchy abrasions and purple contusions involve inner upper and lower quadrants of left breast

Confluent to punctate hemorrhages with linearity.

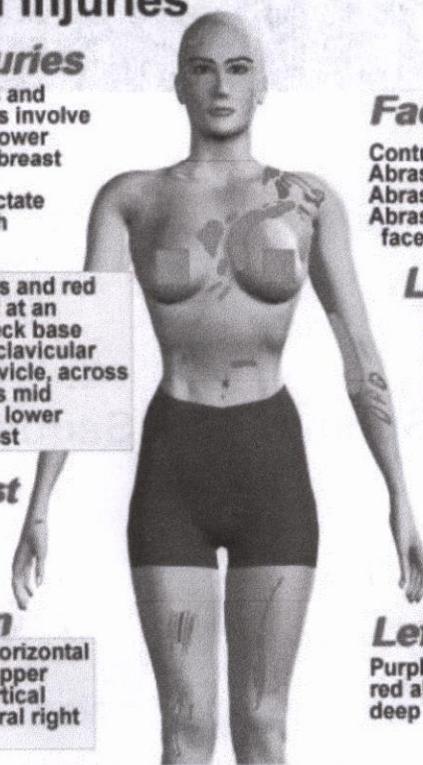
Purple contusions and red abrasions extend at an angle from left neck base across left suprACLAVICULAR fossa and left clavicle, across left breast, across mid chest and across lower right anterior chest

### Right Wrist

Palpable dislocation

### Abdomen

Distended with horizontal abrasion of left upper quadrant and vertical abrasions of lateral right upper quadrant.



### Facial Injuries

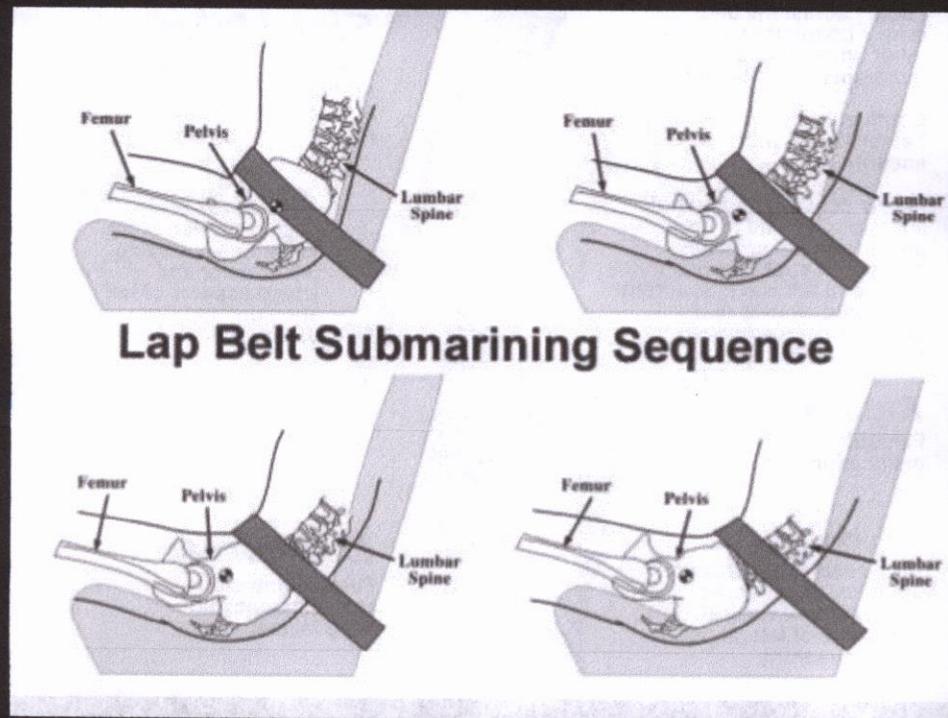
Contusion of left intraorbital ridge  
Abrasion of right forehead  
Abrasion of right eyelid  
Abrasions to right side of face

### Left Shoulder

deep brownish-black abrasions overlying the anterior and lateral aspects of left shoulder and base of the neck

### Left Forearm

Purple contusions, red abrasions and deep lacerations



## Injury marks may not always be 1 ¾ inches

- In crashes where there are multiple components such as a frontal, then a side slap followed by a rollover, it is not uncommon for the bruises to be much wider than the seatbelt due to occupant movement.
- If the seatbelt folds, as it often does at the neck, or across the lap, the bruise or belt abrasions may be much narrower than the webbing.

Any determination of seatbelt use should also evaluate the absence of injuries to the individual whose belt use is being evaluated.

## Lack of Injuries

### Ears

No abrasions, contusions or bruising

### Right Side Face

No multiple facial fractures and/or nasal fractures  
No dental damage  
No jaw fractures  
No glass "dicing" injuries

### Right Shoulder

No right side bruises or abrasions

### Neck

No cervical bony fractures  
No neck soft tissue or ligamentous injuries

### Respiratory

No aorta, heart or respiratory damage  
No deceleration injury

### Cranial

No epidural or subdural hemorrhage  
No deceleration injury

### Left Side Face

No multiple facial fractures and/or nasal fractures  
No dental damage  
No jaw fractures  
No abrasions, bruises or lacerations  
No glass "dicing" injuries

No lower torso injuries

No injuries to tibia, shins, ankles and feet



## LACK OF INJURIES

Any determination of seatbelt use should also evaluate the absence of injuries to the individual whose belt use is being evaluated.

Facial abrasions, contusions or lacerations

Fractured facial bones

Fractured nasal bones

Cervical fractures

Cervical ligamentous injuries

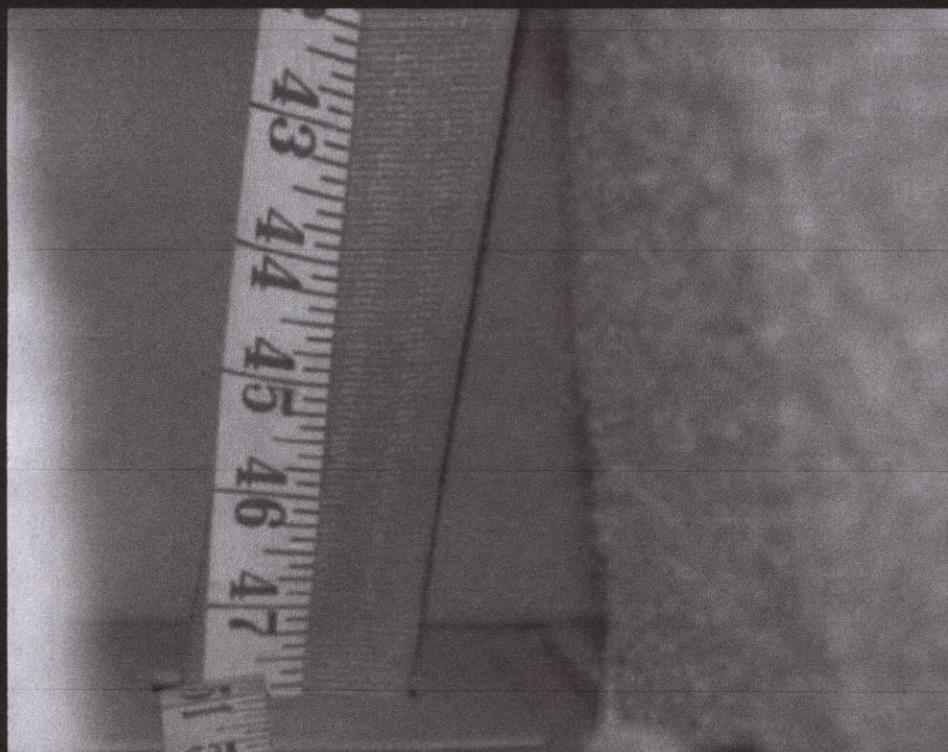
External skull fractures

Abrasions and contusions to shoulders

Abrasions, contusions to lower torso

Fractures to patellas, tibias, fibulas and ankles

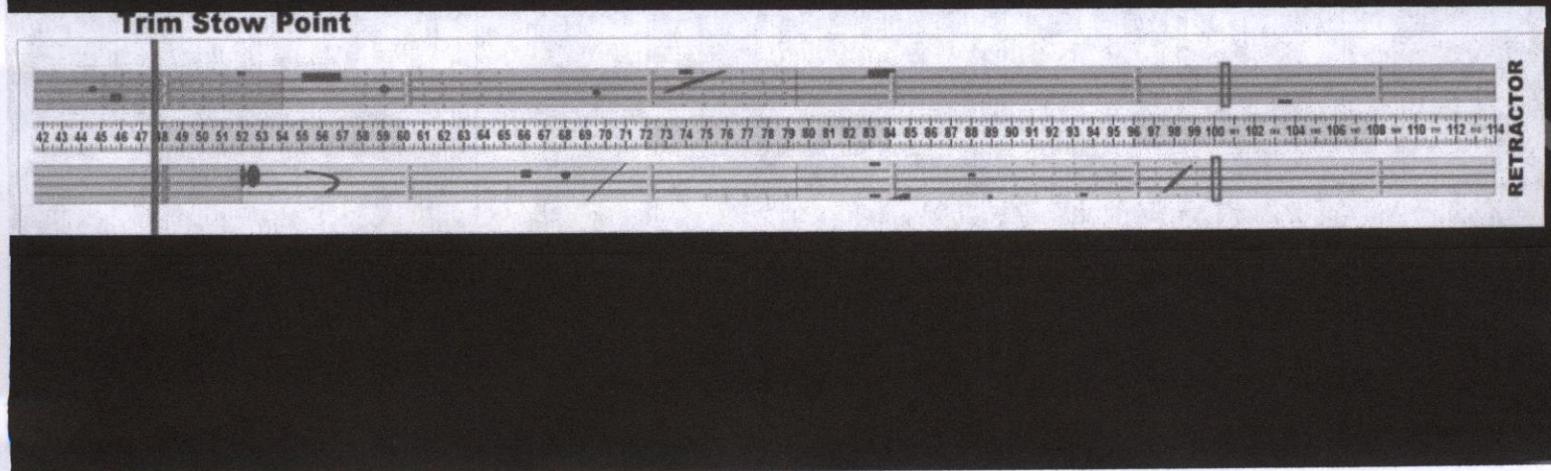
## Investigate, Test and Document



First, determine where the webbing goes into the trim such that the webbing is not exposed to the crash environment when not worn.

Measured position of a "Stowed Belt" where the belt enters the protected area inside the trim.

Second, inspect the seatbelt webbing at all areas below this measurement point. The photograph below shows that no piece of evidence is too small that is placed on the evidence board.



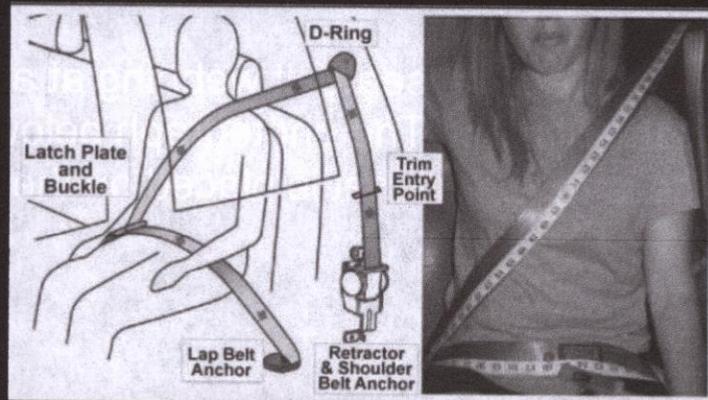
One way to document the location of belt evidence found beyond the trim panel stow point is to focus solely on the areas of the seatbelt webbing that would have been below the point where the webbing goes into the trim. If the seatbelt was not being worn when the accident began, there is little chance that damage to the seatbelt webbing beyond the trim panel stow point could happen.

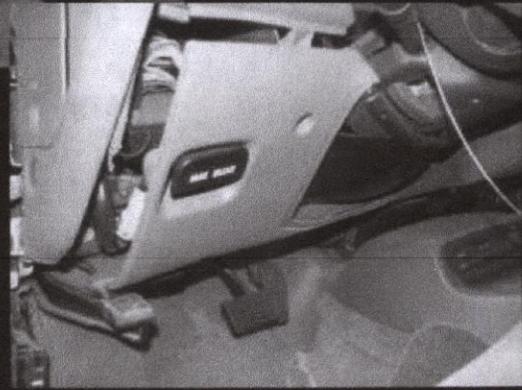
Third, document every mark, cut, dirt/stain, pulled fiber, cupped fiber and damage to the webbing on the label side and non-label side of the belt from 1 inch to the end of the belt. The technician should then transfer each cut, dirt/stain, pulled fiber, cupped fiber and observation of webbing damage onto an evidence board. The best way to accurately and thoroughly document the webbing evidence is to remove the belt and lay it out on a prepared board that has a measuring tape and illustrates the same number of webbing panels as the actual webbing.

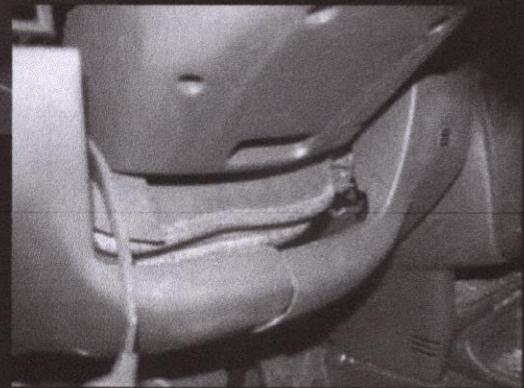
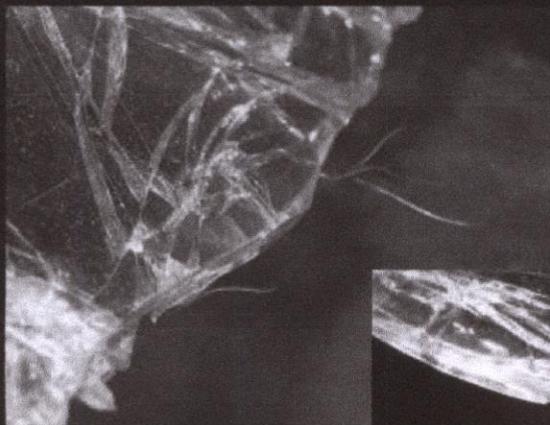
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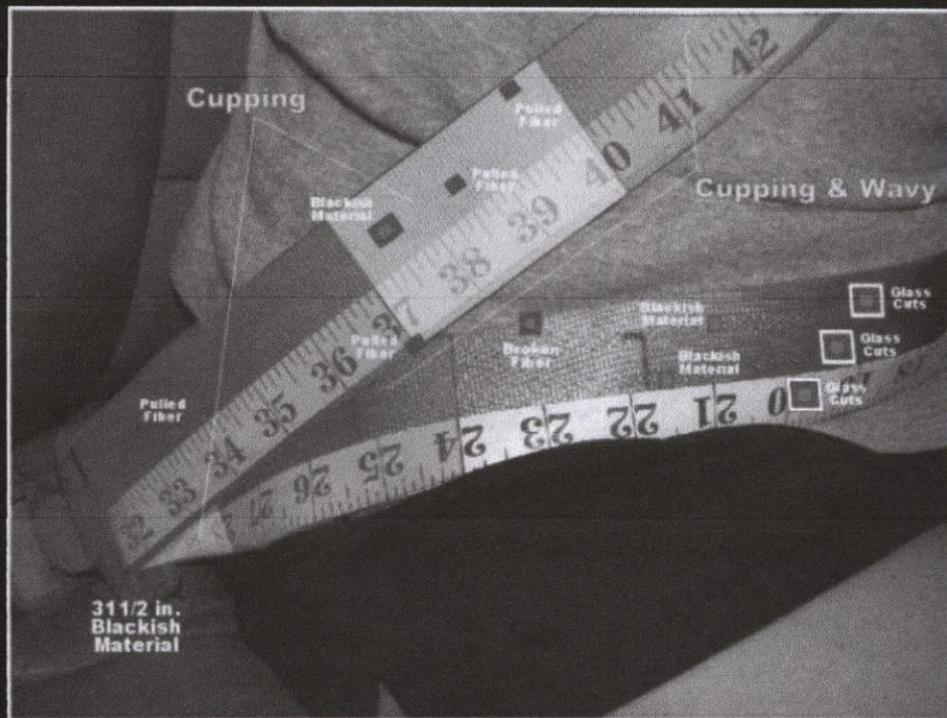
## SURROGATE STUDY- CORRELATING PHYSICAL EVIDENCE TO MEDICAL EVIDENCE

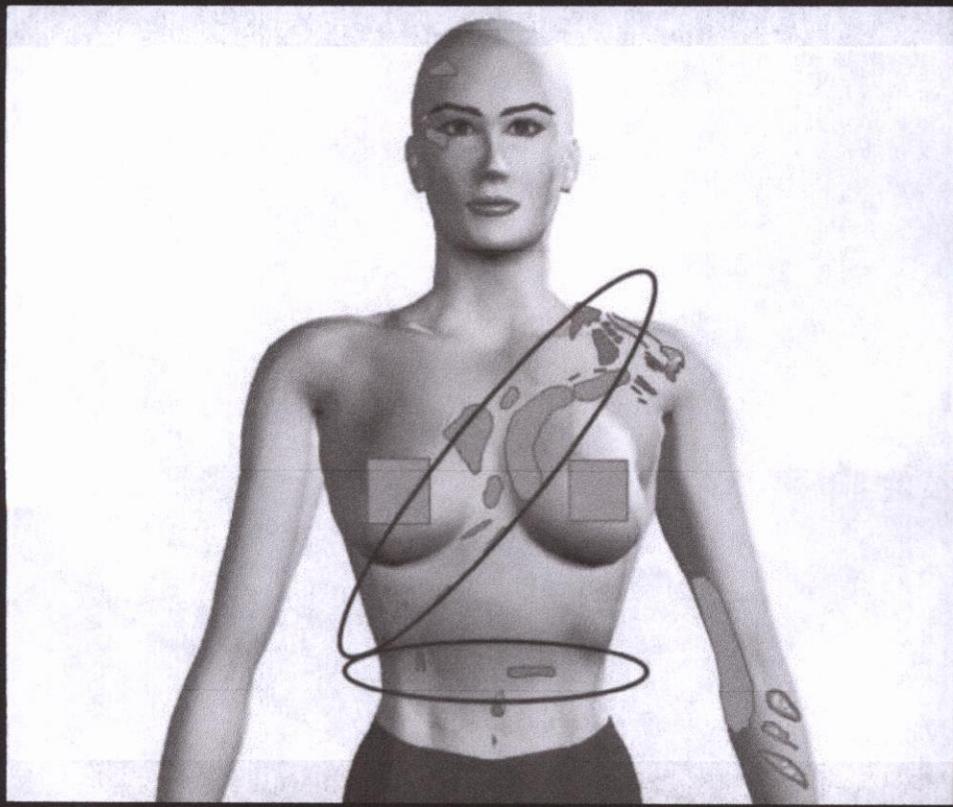
Using a surrogate the same height, weight and waist size as the individual being evaluated, determine where all physical belt evidence that has been transferred onto the seatbelt evidence board matches up on the surrogate's body.

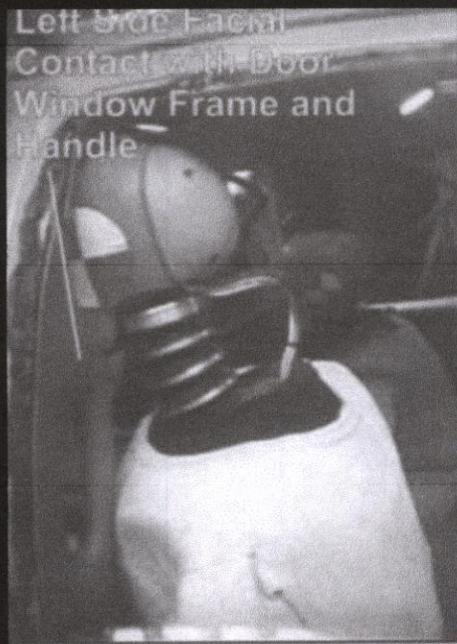












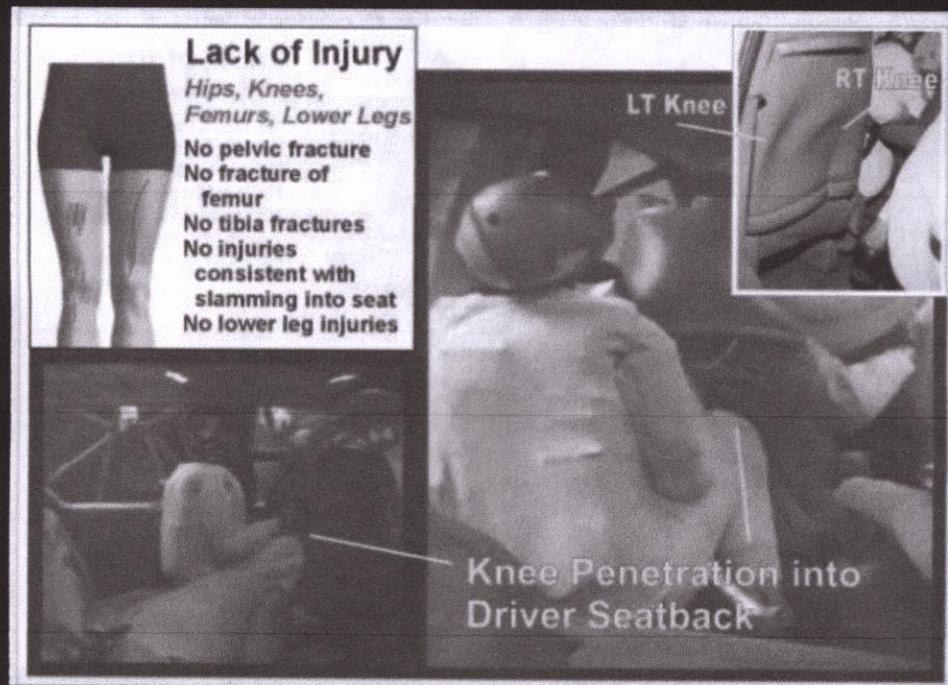
**Lack of Injury**  
**Left Side Face**

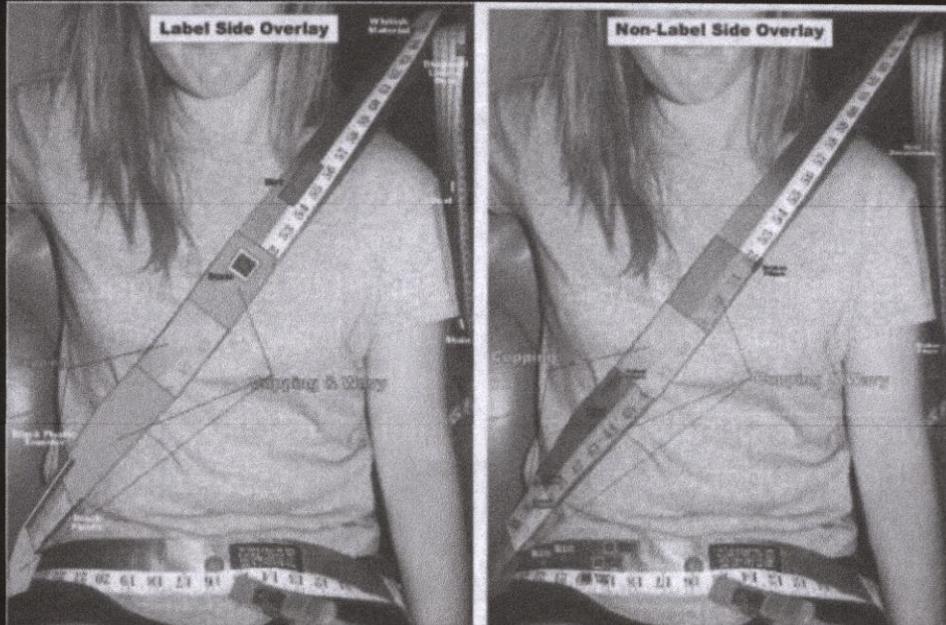
No facial fractures  
and/or nasal fractures  
No dental damage  
No jaw fractures  
No abrasions, bruises or  
lacerations  
No lip or tongue injuries



**Lack of Injury**  
**Right Side Face**

No facial fractures  
and/or nasal fractures  
No dental damage  
No jaw fractures  
No abrasions, or  
lacerations  
No lip or tongue injuries





**Focus on this area of the webbing  
Label and non-label side of seatbelt is laid out on a  
seatbelt evidence board that includes a measuring  
tape.**

## THE VEHICLE INTERIOR MUST BE EVALUATED AND COMPARED TO MEDICAL EVIDENCE

A cut on the seatbelt webbing can correspond to a sign of diagnosing seatbelt usage by evaluating the bruise or abrasion. More pronounced belt loading presence of damage and lack of damage that are like cupping can correspond to deeper bruises or found inside the vehicle. Just like the absence of fractures on the occupant.

Injury is important to the forensic pathologist, the absence or presence of damage to vehicle components like the steering wheel, instrument panel, lower dash, a-pillar, b-pillar and back of the front seats should also be evaluated. When a driver is unrestrained, the steering wheel and knee bolsters are typically deformed and there is hair in the windshield.



### **Expansion loops**

In an effort to favorably modify the kinematics of test dummies in barrier impacts, seat belt assembly designs often incorporate expansion loops. An expansion loop introduces additional webbing length when a predetermined level of tension is reached. Expansion loops are composed of webbing that is folded along the short axis and stitched in place

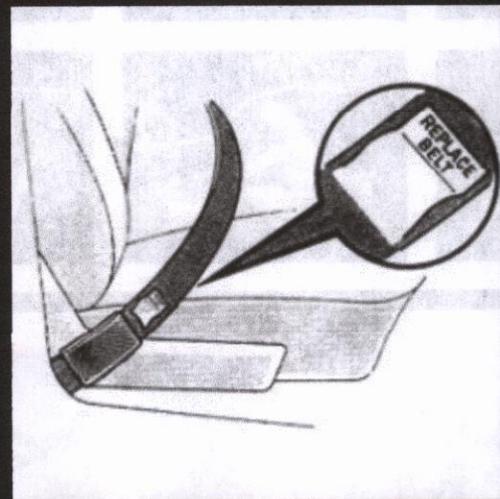
The thread material and stitch pattern used to make the rows of stitching is designed to tear at predetermined webbing tension levels, for instance around 600 to 700 pounds. When the stitches tear, the webbing fold will partially open thereby introducing additional webbing. Photograph shows the torn stitches of an expansion loop during a test.

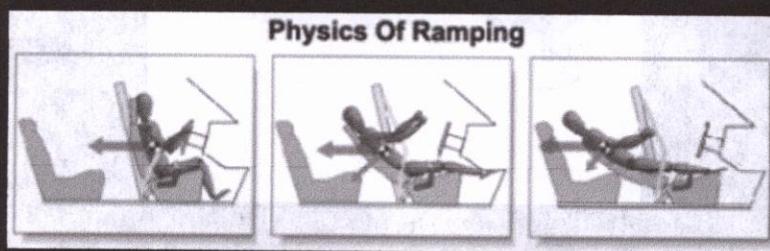
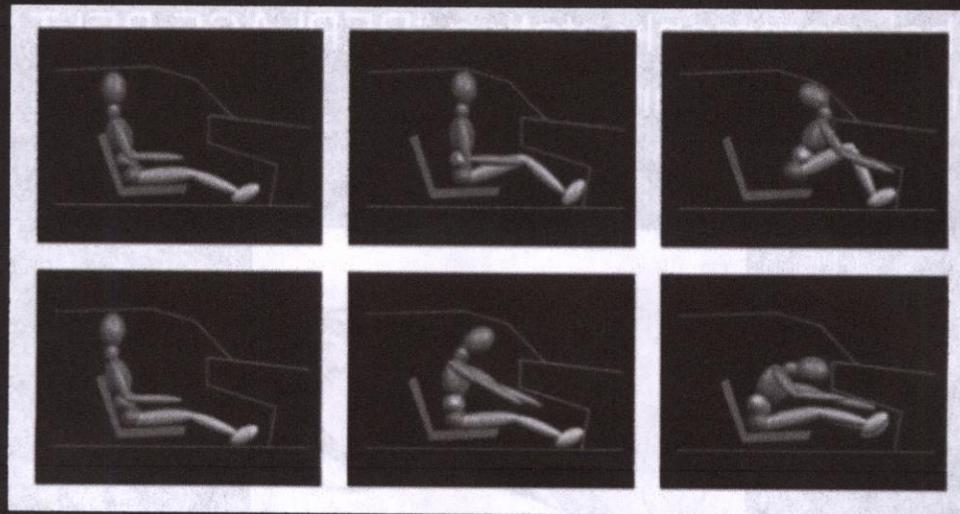


## Seat Belt Anchors

Seat belt attachments are points where the occupant restraining forces are transferred from the seat belt assembly to the vehicle structure. If the webbing does not terminate at a retractor, then the webbing end is anchored to the vehicle.

A warning label, commonly stating “REPLACE BELT,” is often visible after the stitches are torn.



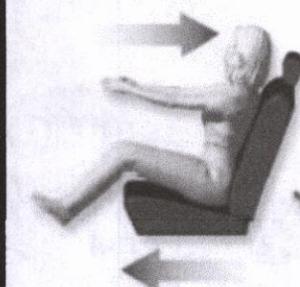


Rear –End Collision

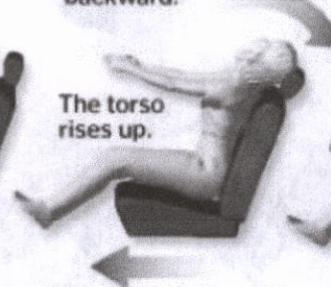
## How whiplash occurs

Motorists involved in rear-end crashes commonly experience whiplash. Injuries to the neck occur as the torso accelerates forward and the neck lags, then the head whips forward.

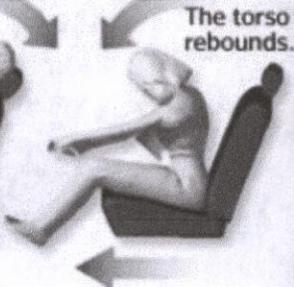
1. During normal driving, the head and torso move relative to the vehicle.



2. As the vehicle is struck from behind, the head tilts backward.



3. After the initial impact, the head snaps forward.



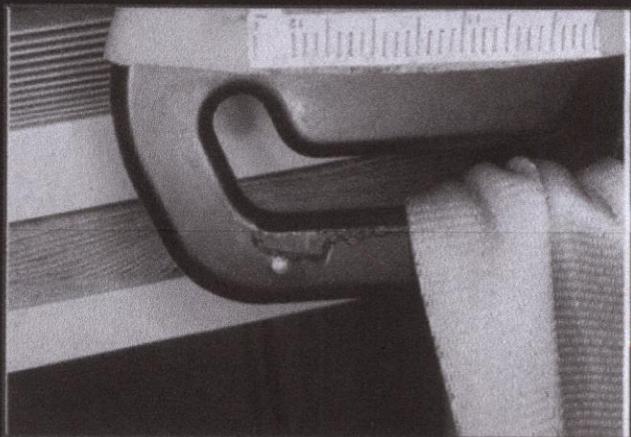
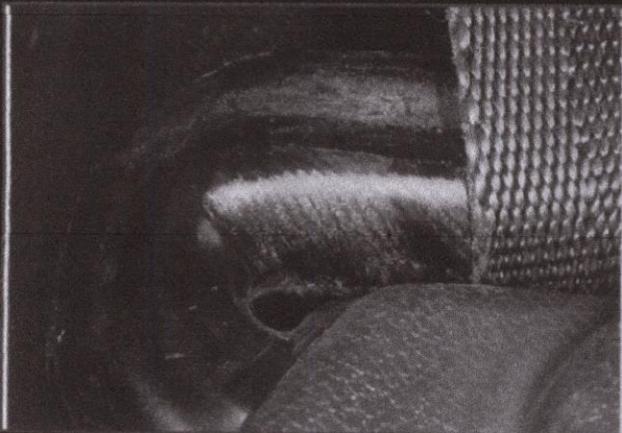
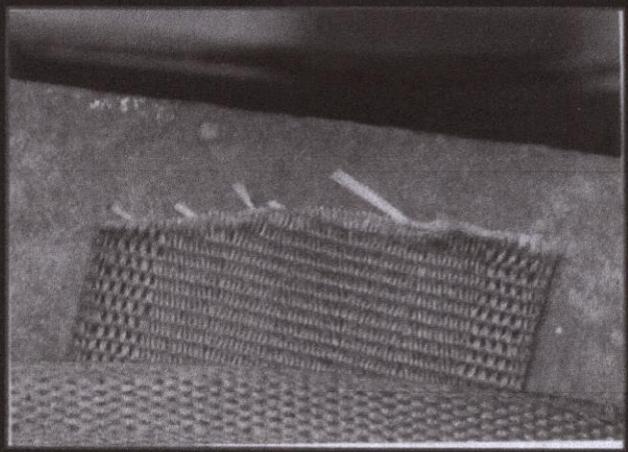
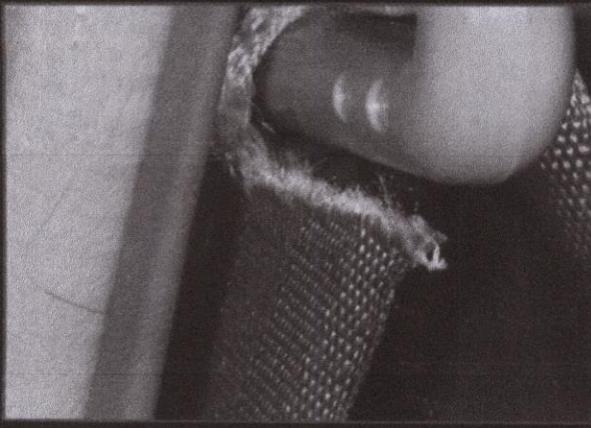
Vehicle traveling forward

Source: Insurance Institute for Highway Safety

Tim Summers / The Detroit News



They're designed for rear-seat occupants only and, in the event of a frontal or side impact, will inflate the belt across a passenger's chest in 40 milliseconds. When expanded, the belt cover five times more surface area of the body than a normal seat belt, which helps better distribute the forces of a crash.



Under the multi-disciplinary approach, no one particular piece of evidence trumps another. The evidence, when considered as a whole, is utilized to help diagnose seatbelt usage or non-usage. When the “loop is closed,” the investigator can accurately say that a person is belted or unbelted having considered all of the evidence.



# Seat Belt Recalls and Notices

*http://www.safercar.gov.*

**SUZUKI.** **CAMPAIGN**

## Service Bulletin

NUMBER: SC-39  
PAGE: 1 of 3

**SUBJECT:** SAFETY RECALL NOTICE No. KY  
Driver and Front Passenger Seat Belt Buckles

**MODEL:** Certain 2006 and 2007 Suzuki Forenza and Reno Models

Suzuki Motor Corporation has decided to conduct a Safety Recall campaign on certain 2006 and 2007 Suzuki Forenza and Reno vehicles. The campaign code is "KY".

Affected vehicles were produced with improperly manufactured driver and front passenger seat belt buckles. It is possible that plastic pieces inside the seat belt buckle can break off and remain inside the buckle. The buckle could fail to latch, or could seem to have latched without latching completely. If the buckle does not latch completely, the buckle could release without pressing the release button. These buckle malfunctions, which could prevent a person from using the seat belt or could cause the seat belt to fail to function as designed, can increase the risk of injury in a crash.

Suzuki dealers are requested to replace driver and front passenger seat belt buckles. Refer to Forenza/Reno Technical Bulletin, Restraint TS 04 07277.

**1. Affected Vehicles**

Certain 2006~2007 Suzuki Forenza Sedan  
KL5JD56Z 6K234758~KL5JD56Z 7K597150

## GM recalls 300,000 Impalas over seat belt problem

Posted: 12:52 pm Fri, October 15, 2010  
By Associated Press



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DETROIT – General Motors said Friday it was recalling more than 300,000 Chevrolet Impala sedans because the seat belts may fail to restrain people in the front seats during a crash.

The National Highway Traffic Safety Administration said on its website that the front-seat belt webbing may not be secured properly to a lap belt anchor on the side of the seat near the doors.

The recall affects Impalas from the 2009 and 2010 model years. GM said 303,100 vehicles are in the United States and more than 19,000 are in Canada.

GM said in a statement that it did not know of any injuries or deaths connected to the recall. The Detroit automaker told NHTSA that it had received 32 warranty reports with the seat belt conditions through mid-August.

Dealers will inspect how the belts are anchored. They will reinstall the anchors if needed at no cost to the owners.

Owners will be notified later this month and can contact Chevrolet at 1-800-630-2438.



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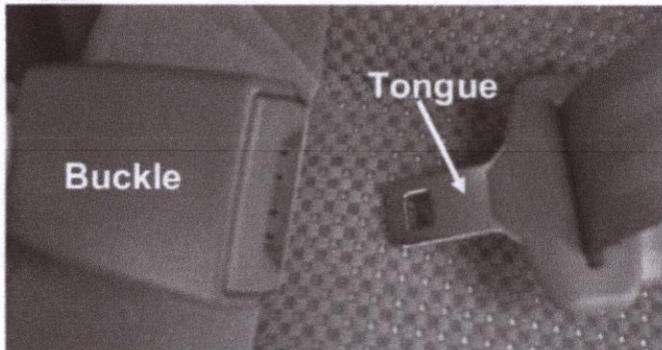
#### IMPORTANT SAFETY RECALL NOTICE

Dear Suzuki Owner:

This notice is being sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Suzuki Motor Corporation has decided that a defect which relates to motor vehicle safety exists in certain 2006 and 2007 Suzuki Forenza and Reno vehicles. According to our records, you own one of the vehicles affected by this recall.

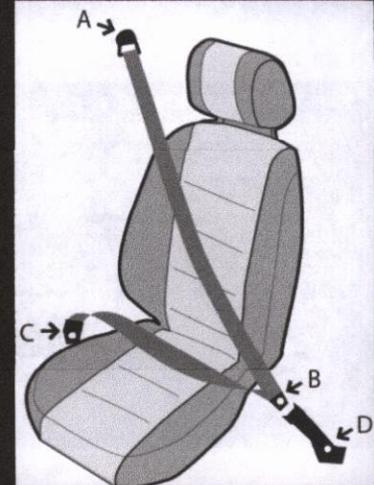
Affected vehicles were produced with improperly manufactured driver and front passenger seat belt buckles. It is possible that plastic pieces inside the seat belt buckle can break off and remain inside the buckle. The buckle could fail to latch, or could seem to have latched without latching completely. If the buckle does not latch completely, the buckle could release without pressing the release button. These buckle malfunctions, which could prevent a person from using the seat belt or could cause the seat belt to fail to function as designed, can increase the risk of injury in a crash.



To correct this condition, your Suzuki dealer will replace the front seat belt buckles on your vehicle at no cost to you for parts and labor.

## Common Problems

- Corrosion
  - Material obstructing positive latch
  - Torsion bar
  - Latch locking issues
  - Defective webbing
  - Anchors defective



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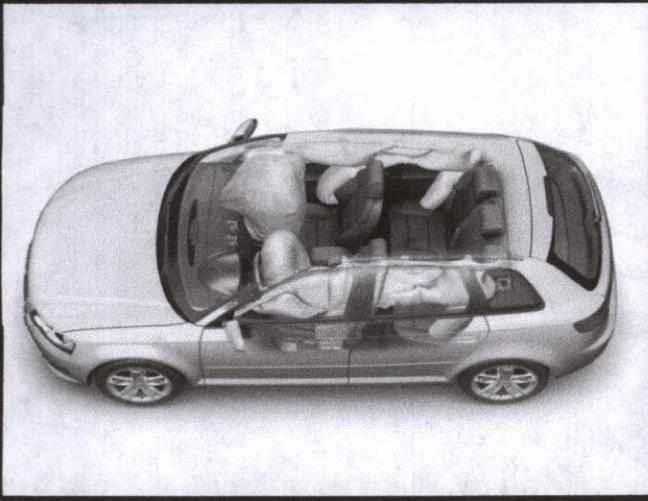
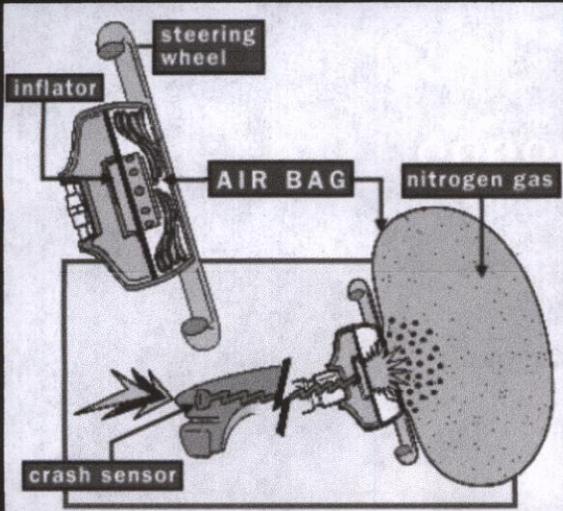
**CHILD SAFETY** 

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Questions???????

